The Importance of Social Support for Nurses in a General Acute Context

Summary
Nursing is often stressful due to high demands and dissatisfaction with pay, which impacts the mental wellbeing and productivity of nurses. This study presents a novel approach to nurse stress by exploring the demands-control-support model with organisational justice. The data from 190 midwives and nurses in a medium Australian hospital revealed that the model is applicable to the prototypical context of a general acute hospital, and that job control, supervisor support and outside work support work improve job satisfaction and mental health of nurses. Most importantly, supervisor support was found to buffer the impact of excessive work demands. Fairness of procedures, distribution of resources, and the quality and consistency of information are also beneficial. Resources, especially social support, are the crux of reducing and buffering the negative effects of work demands on nurses' mental health.

The Importance of Social Support for Nurses in a General Acute Context

Nursing has been consistently identified as a high-stress occupation. Many sources of nurses' stress have been identified including workload, staff shortages, leadership and management styles, shiftwork, dissatisfaction with pay, professional conflict, the emotional demands of nursing, and dealing with death and dying (see McVicar, 2003 for a review). Subsequently, associations have been drawn between increased occupational stress among nurses and a number of deleterious outcomes including decreased job satisfaction and organisational commitment, early burnout, increased absenteeism and turnover, clinical errors and reductions in the quality of patient care. That is, working conditions have a crucial impact on nurses and their patients. The last two decades have seen an improved understanding of the mechanisms of stress and the consequential strain on nurses, leading to more finely tuned responses for improving working conditions and patient outcomes. Building on this knowledge, the impact of justice in the workplace is gaining prominence in the literature and provides managers and administrators with a more diverse tool kit to not only improve conditions but also to buffer the impact of stressors that are inherent in the work.

Theoretical Background

The demand-control-support (DCS) model provides a widely-used framework for the analysis of the factors which may contribute to occupational stress among nurses. The model originates from the demand-control (DC) model developed by Karasek (1979), which proposes that there are two main factors which predict job strain: job demands and job control. The central prediction of the DC model is that the greatest stress would be experienced in situations in which an employee had high job demands but low job control; these are known as 'high strain' jobs. Cohen and Wills (1985) expanded the DC model to include the effects of social support (from both within and outside work). Further research into the impact of various sources of support prompted Karasek and Theorell's assertion that supervisor and co-worker support are key variables in buffering the impact of high strain jobs (1990). According to the revised model, high strain jobs are those with high job demands and low job control/social support.

Research using the full DCS model has shown that the three variables in the model predict outcomes related to nurses' mental health and job satisfaction (e.g. Hall, 2007, van Yperen & Hagedoorn, 2003, Munro, Rodwell & Harding, 1998). Hausser et al. (2010) identify a distinction between two hypotheses arising from Karasek's DCS model: the strain hypothesis (additive effects) and buffer hypothesis (multiplicative/interaction effects). The strain hypothesis refers generally to the increased risk of reduced well-being associated with low job control and high job demands, where these two factors may exert independent main effects. Elements of the DCS model have been shown to mediate the effects on wellbeing of other work-related factors such as job insecurity and shiftwork (Elovainio et al, 2009; Kivimaki et al., 2000). These studies have generally shown that each of the DCS variables exerts an additive effect on outcomes of interest.

In contrast, the buffer hypothesis refers specifically to interaction effects of demand, control, and support where increased control and/or support, may reduce the negative effects of high demands. Two way interactions occur between demand and control or between demand and support variables. Three way interactions involve all three of the DCS variables and are less consistently found in the literature (Hausser, 2010). The buffer hypothesis rests on the assumption that increasing job control and or support is beneficial in moderating the deleterious effects of high demands. However, some research proposes that curvilinear relationships between DCS variables and outcomes may lead to the detection of artifactual interaction effects (Cohen, Cohen, Aitken & West, 2003). Curvilinear relationships are not novel and have been identified previously between work characteristics and stress outcomes; a classical example of this being Selye's U-shaped representation of the effects of stress. However, analysis of curvilinear relationships has been lacking from much previous DCS research, leading to calls for an examination of these effects (Van der Doef & Maes, 1999). Consequently, it is recommended that studies of stress-related variables assess whether the associations observed between variables are linear or curvilinear (e.g. Abu al Rub, 2004).

Organisational Justice

Another factor which has been applied as a supplement to the DCS model is organisational justice, which generally refers to the extent to which employees are treated with fairness in the workplace. According to Colquitt (2001) there are four dimensions of organisational justice: procedural, distributive, interpersonal, and informational. Procedural justice refers to the fairness of the employer's process of decision-making. Distributive justice refers to the perceived fairness of the decision outcomes. Informational justice refers to the perceived adequacy and honesty of explanations provided by the employer. Interpersonal justice refers to the level of respect with which employees are treated when dealing with organisational representatives. The effects of organisational justice have received comparatively little attention within the nursing literature and those studies that have been conducted typically measured only one or two dimensions of justice.

Organisational injustice has been conceptualised as a stressor in its own right, which may incrementally increase stress in addition to DCS variables. This notion is supported by findings that organisational injustice tends to be associated with similar outcomes to occupational stress, such as turnover, lower job satisfaction (McFarlin & Sweeney, 1992), wellbeing (Kivimaki et al., 2003) mental distress (Elovainio et al., 2002), decreased quality of patient care (Pekkarinen et al., 2008). In a meta-analysis of 25 years of research (Colquitt, Conlon, Wesson, Porter, & Ng, 2001) found the distributive and procedural forms of justice in particular, were associated with a range of employee attitudes and behaviours.

Interaction effects between the dimensions of justice have also been demonstrated. McFarlin and Sweeney (1992) found a significant interaction effect between procedural and distributive justice on job satisfaction, pay level satisfaction and organisational commitment in a sample of bank employees. Similarly, Brockner and Weisenfeld (1996) have suggested that the impact of justice outcomes that are perceived as unfair is buffered by the sense that the process of decision making was just. More recently, the moderating effect of justice variables in nursing is emerging in the literature. Heponiemi, Elvovainio Pekkarinen & Sinervo (2008) found that organisational justice can act as a buffer against strain and its' impact on work-life balance.

Folger (1986) provides an explanation for this relationship in the form of referent cognitions theory (RCT). Brockner and Weisenfeld summarise referent cognitions theory; "RCT suggests that the joint presence of (a) unfair procedures (more recently defined to include the conduct of the decision implementers) and (b) unfavorable outcomes elicits greater resentment than any other combination of conditions" (1996, p.193). RCT continues to find support in the literature and may have a role in nursing and healthcare research. For example Janssen (2004) found support for the theory in a sample of healthcare workers where perceptions of distributive fairness interacted with perceptions of procedural fairness, moderating the relationship between demanding innovative workplace behaviour and stress.

The present study will extend previous applications of the DCS to nursing research in a number of important ways. Firstly, we test the DCS model including curvilinear effects, to further clarify the nature of the relationship between DCS model variables and Job satisfaction, psychological distress and depression. We expect to find that demand, control and support will exert main effects on all three outcome variables. Because interaction effects are less consistently found we will control for interaction artefacts by testing for non-linear relationships. Secondly, the current paper extends the DCS model by including justice variables measured along Colquitt's four dimensions. Organisational justice effects, both linear and non-linear, will be examined in addition to tests for interaction effects for procedural and distributive justice. We expect that the justice variables will make a significant contribution to the outcomes for nurses.

METHOD

Sample

Two hundred and nine midwives and nurses working at a medium-sized Australian hospital facility were surveyed for this study. Nineteen participants had data missing from key study variables and

were therefore excluded, leaving a sample of 190. The majority of the respondents were female (90.5%). Respondents were also mostly employed part-time (71.1%) and had worked for the organisation for nine years or less (80.5%). The ages of respondents were distributed approximately evenly across the age scale employed (less than 25 years = 7.4%; 25-34 years = 18.4%; 35-39 years = 14.7%; 40-44 years = 16.3%; 45-49 years = 15.3%; 50-54 years = 13.7%; 55+ years = 13.2%).

Measures

There were three outcome variables in this study: job satisfaction, psychological distress and depression. The predictor variables were job demands, job control, social support and organisational justice. All of these scales had reliability coefficients between .64 and .94 (see Table 1).

Job satisfaction was assessed using a shortened, six-item version of Brayfield and Rothe's (1951) satisfaction scale. Responses were made on a 5-point scale (1 = 'strongly disagree, 5 = 'strongly agree). An example item is: 'I find real enjoyment in my job'.

Psychological distress was measured using the Kessler Psychological Distress Scale/ K-10 (Kessler & Mroczek, 1994). This scale assesses perceived psychological distress over the past 30 days, and contains ten items (e.g. 'Did you feel hopeless'). Responses were made on a 5-point scale (1 = 'all of the time', 5 = 'none of the time'). Prior to analysis these items were reverse coded such that a higher score reflects greater psychological distress.

Depression was assessed using a shortened, nine-item version of the Centre for Epidemiological Studies Depression Scale, the CES-D (Radloff, 1977). Responses were made on a 4-point scale (0='rarely or none of the time', 3= 'most or all of the time'). An example item is: 'I felt that everything I did was an effort'.

Job demands were measured using the 11-item scale developed by Caplan, Cobb, French, Harrison and Pineau (1980), which assess physical and psychological demands. Responses to all items were made on a 5-point scale. The scale labels to four of the items (e.g. 'How often is there a great deal to be done?') were 1 = 'very often' to 5 = 'rarely'. The remaining seven items (e.g. 'How much workload do you have?') were rated on a scale of 1 ('A great deal') to 5 ('Hardly any').

Job control was measured using Karasek's (1985) 9-item scale. Each of the items was rated on a 5-point scale (1=strongly disagree, 5= strongly agree). An example item is: 'My job requires me to make a lot of decisions on my own'.

Social support was measured using the 4-item scale developed by Caplan et al. (1980). The scale measured the support obtained from three sources: the employee's supervisor, work colleagues and outside work. For each of the four items, three answers were required relating to each of the three sources of support. Responses were made on a 5-point scale (0 = 'don't have any such person', 4 = 'very much).

Organisational justice was measured using the 20-item scale developed by Colquitt (2001). Respondents were asked questions relating to decisions regarding pay increases and/or promotions. This contained four subscales: procedural, distributive, interpersonal and informational justice. Seven items assessed procedural justice (e.g. 'Have those procedures been applied consistently?'); four items assessed distributive justice (e.g. 'Are your benefits justified, given your performance?'); four items assessed interpersonal justice (e.g. 'Have they treated you with respect?'); and the remaining five items assessed informational justice (e.g. 'Have they communicated details in a timely manner?'). All of these items were rated on a 5-point scale (1=very often, 5 = rarely).

RESULTS

Table 1 displays the descriptive statistics for, and correlations between, each of the study variables. Significant correlations were observed between each of the outcome variables and a number of the predictor variables. To identify the particular variables that predict each of the outcome variables, the predictor variables (along with their squared and interaction terms) were entered into a multiple regression analysis for each outcome variable. Blocks of predictor variables were entered into the

analysis in the following order: (1) DCS variables, (2) DCS squared variables, (3) DCS two-way interactions, (4) DCS three-way interactions, (5) justice variables, (6) justice squared variables, (7) justice two-way interaction. The raw predictor variables were centred before creating the squared variables and interaction terms. Before conducting the multiple regression analysis, preliminary analyses were conducted to ensure that the assumptions of this analysis were not violated. A square root transformation was applied to the depression variable.

Table 2 shows the results of these multiple regression analyses. The overall regression model accounted for a significant proportion of variance in each of the three outcome variables: job satisfaction (R^2_{adj}=.206, F(29,156)=2.65, p<.001), psychological distress (R^2_{adj}=.105, F(29,154)=1.74, p<.05) and depression (R^2_{adj}=.171, F(29,155)=2.31, p<.01). The first block of predictors, the DCS variables, accounted for a significant proportion of variance in each of the outcome variables. Job demands were a significant predictor of all three outcome variables; it predicted greater psychological distress and depression, and lower job satisfaction. Job satisfaction was also predicted by job control and supervisor support. Outside work support was a predictor of lower psychological distress and depression. In addition to the DCS variables, the only other predictor of psychological distress was the interaction between demands and supervisor support, which was a negative predictor. This interaction was also a negative predictor of depression. Informational justice and distributive justice squared predicted lower depression. The interaction between procedural and distributive justice was a significant predictor of job satisfaction.

DISCUSSION

The current paper found support for both hypotheses. Firstly, the results broadly confirm the main effects of demands, control and supervisor support on job satisfaction and for demand and outside work support on psychological distress and depression. Further, there was a significant interaction between demands and supervisor support on both psychological distress and depression. In the current research we found no non-linear relationships between DCS variables and the outcome measures.

Confirmation of our second hypothesis was more limited. We found significant effects for informational justice and for distributive justice on depression, and the relationship between depression and distributive justice was non-linear. Further evidence of the importance of the justice variables in nursing was found in the significant interaction between procedural justice and distributive justice on job satisfaction.

The DCS Model

In the current study, the most prominent predictors for all three outcomes were the main effects of DCS, in addition to significant interaction effects between demands and supervisor support for both mental health outcomes. Specifically, demands negatively predicted job satisfaction and positively predicted depression and distress, whereas job control predicted job satisfaction. All outcomes were predicted by some form of support, whereby outside work support negatively predicted psychological distress and depression, and supervisor support predicted job satisfaction. The significant interaction variable suggests that supervisor support decreases the effect of demands on both mental health outcomes.

These results are consistent with previous research. In relation to Hausser et al. (2010), these results confirm the strain hypothesis, whereby demands and control exert additive effects on nurses' job satisfaction, and demands exert independent effects on nurses' mental health and job satisfaction (e.g. Hall, 2007, van Yperen & Hagedoorn, 2003, Munro et al., 1998). The absence of non-linear DCS effects further strengthens the message of these linear main effects (Abu al Rub, 2004). The small contribution of the interaction between demands and supervisor support is consistent with the buffer hypothesis, whereby interaction effects of DCS variables moderate outcomes (Hausser et al., 2010), given that supervisor support ameliorates the effects of demands on mental health.

Overall, these findings illustrate the negative effects of demands on nurses' job satisfaction and mental health, and the important role of support from supervisors and outside work in

maintaining nurses' psychological health and satisfaction. Consequently, these results suggest some important ways that health organisations, specifically general acute hospitals, could improve the mental health of nurses. First, decreasing excessive work demands on nurses should improve these outcomes, though given the current shortage of nurses across the health sector and the continuing escalation of health related needs from the community, this action may be unrealistic for many hospitals. Second, if work demands cannot be changed, then improving the support that nurses receive from their supervisors is paramount in buffering the negative effects of work demands on nurses' wellbeing. Therefore, efforts to improve mental health outcomes in nurses must focus on improving supervisor support, possibly through training of supervisors and the provision of resources to enable supervisors to provide this support. Also, organisations can take more novel approaches such as focusing on decreasing bullying from supervisors in the workplace, as bullying could be considered the antithesis of support, and bullying towards nurses is prevalent in the health sector, especially from supervisors (i.e. Farrel, Bobrowski, & Bobrowski, 2006, Quinne, 1999). As supervisor support is also beneficial for nurses' job satisfaction, then the aforementioned strategies to improve this support should improve this outcome as well. In addition, the results suggest that increasing nurses' control over their own work, or at least provide them with more input at work, should also improve job satisfaction among nurses.

Health care organisations have a responsibility for their employees wellbeing; however, nurses must also be responsible for their own mental health. The results from the current study demonstrate that support from people outside work (i.e. family, friends, other sources) is vital for nurses to guard against psychological distress and depression. As such, nurses must make effort to foster their own support networks, beyond the work environment, to improve ands maintain their own wellbeing. Additionally, their employers should encourage them to develop and utilise these outside work supports, perhaps though initiatives that educate the nurses regarding the benefits of outside work support and offering some guidance in developing these networks.

Organisational Justice

The exploration of organisational justice is a relatively novel approach to work-related and mental health outcomes among nurses, yet analysing these aspects with the DCS model elicit some important results. Informational justice and distributive justice squared negatively predict depression. Specifically, depression slightly increases as the lower end of distributive justice increases, but more importantly, depression dramatically diminishes as distributive justice increases from moderate to high levels. These findings substantiate previous research that found organisational justice affects outcomes related to occupational stress (Kivimaki et al., 2003, Elovainio et al., 2002).

The moderating effect of justice as illustrated by the interaction between procedural and distributive justice reinforces findings from Janssen (2004), but only for job satisfaction. Given the focus of Janssen's (2004) study on innovative work behaviours, this justice interaction may only occur for work-related outcomes rather than mental health. These findings are compatible with the explanation given by Folger (1986) that procedural injustice and poor outcomes interact to increase negative work-related feelings of workers, and are also compatible with the notion that the negative effects of poor distributive injustice can be buffered by procedural justice (Brockner & Weisenfeld, 1996, Heponiemi et al., 2008).

The findings suggest that initiatives relating to organisational justice could be applied to general acute hospitals to improve the job satisfaction and depression of nurses. First, although improving procedural and distributive justice individually may not affect job satisfaction, improving both together should improve this outcome in nurses. As such, to improve job satisfaction in these nurses, their organisations should focus on improving procedural justice, possibly by making decision processes more transparent and inclusive, and ensuring that policy procedures are fair for employees, and at the same time, taking initiative to improve distributive justice. Although most organisations may consider distributive justice to be solely about remuneration, and in part it is, increasing wages may not always be feasible given funding constraints. However, organisations

may improve distributive justice in other ways, such as providing frequent genuine praise for good performance, initiating formal reward and recognition programs, or providing better job conditions such as flexible work arrangements. The preceding strategies to improve distributive justice would also be expected to diminish feelings of depression among nurses.

Improving informational justice may also decrease depression in nurses, and fortunately, informational justice may be the easiest form of justice to improve. To do so, organisations simply need to increase the quality and consistency of their communications with employees, such as providing regular information to nurses regarding decision processes and justifications for decisions made (i.e. promotions, work proposals; though the reasons behind these decisions must also be perceived as fair by the nurses.), and timely and appropriate communications regarding planned and current change initiatives.

This study provides some important results and consequent implications for the DCS model in a nursing context, though it is not without limitations. This study was cross-sectional in nature, so causality between variables could not be determined. Further, this study was conducted in one general acute hospital, and as such, the results may not be generalisable to other general acute hospitals. Future studies should be conducted longitudinally, and across several hospitals, to address these limitations. Other outcome variables such as quality of patient care, intent to withdraw and absenteeism could also be examined in future, in relation to the DCS model among nurses.

Conclusion

The current study demonstrates that the DCS model, especially the buffering effect of social support on work demands, is applicable to the prototypical context of a general acute hospital. The main effects of DCS illustrate that job control and supervisor support are vital for job satisfaction and mental health of nurses, especially support from outside work (Munro et al., 1998), in this context. Additionally, the impact of demands can be buffered through increased supervisor support (Cohen & Wills, 1995).

To improve these outcomes, both the health organisation and the nurses employed by them must develop resources to improve their mental health and job satisfaction. Specifically, nurse supervisors in general acute health care settings should find ways to foster their support towards their subordinates to improve employees' job satisfaction, whereas nurses could develop greater support networks outside the work environment to improve their own mental wellbeing. Additionally, these health organisations should also find ways to increase nurses' job control, which should then increase their job satisfaction. Lastly, organisations should make efforts to improve or maintain a high level of fairness and transparency in their decision making processes, and improve the recognition of good performance, and nurses' rewards and remuneration. Though increasing nurses' salaries might not be feasible for many reasons, other aspects, such as flexible work arrangements, may be sufficient to instigate positive change. Ultimately, though this study had some minor limitations, this study illustrates that resources are the crux of reducing and buffering the negative effects of excessive work demands on nurses' mental health, especially in the form of social support from supervisors and outside work.

REFERENCES

Abu Al Rub, RF 2004, 'Job stress, job performance, and social support among hospital nurses', *Journal of Nursing Scholarship*, vol. 26, no. 1, pp. 73-78.

Brayfield, AH & Rothe, HF 1951, 'An index of job satisfaction'. *Journal of Applied Psychology,* vol. 35, no. 5, pp. 307-311.

Brockner, J & Weisenfeld, BM 1996, 'An integrative framework for explaining reactions to decisions: Interactive effects of outcomes and procedures', *Psychological Bulletin*, vol. 120, no. 2, pp.189-208.

Caplan, R, Cobb, S, French, J, Harrison, R & Pinneau, S 1980, *Job demands and worker health*. Ann Arbor, MI: Institute for Social Research.

Cohen, J, Cohen, P, West, SG & Aiken, LS 2003, *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Cohen, S & Wills, TA 1985, 'Stress, social support, and the buffering hypothesis', *Psychology Bulletin*, vol. 98, pp. 310-357.

Colquitt, JA 2001, 'On the dimensionality of organizational justice: A construct validation of a measure', *Journal of applied Psychology*, *86*, 386—400.

Colquitt, JA, Conlon, DE, Wesson, MJ, Porter, COLH & Ng, KY 2001, 'Justice at the millennium: A meta-analytic review of 25 years of organizational justice research', *Journal of Applied Psychology,* vol. 86, no. 3, pp. 425-445.

Elovainio, M, Kivimäki, M & Vahtera, J 2002, 'Organizational justice: Evidence of a new psychosocial predictor of health', *American Journal of Public Health*, vol. 92, no. 1, 105-108.

Elovainio, M, Ferrie, JE, Gimeno, D, De Vogli, R, Shipley, M, et al. 2009, 'Organizational justice and sleeping problems: The Whitehall II study', *Psychosomatic Medicine*, vol. 71, no. 3, pp. 334-340.

Folger, R 1986, 'Relative deprivation and referent cognitions: Distributive and procedural justice effects', *Journal of Experimental Social Psychology,* vol. 22, no. 6, pp. 531-546.

Hall, DS 2007, 'The relationship between supervisor support and registered nurse outcomes in nursing care units', *Nursing Administration quarterly*, vol. 31, no. 1, pp. 68-80.

Hausser, JA, Mojzisch, A, Niesel, M & Schultz-Hardt, S 2010, 'Ten years on: A review of recent research on the job demand-control(-support) model and psychological well-being', *Work & Stress*, vol. 24, no. 1, pp. 1-35.

Heponiemi, T, Elvovainio, M, Pekkarinen, L & Sinervo, T 2008. 'The effects of job demands and low job control on work-family conflict: The role of fairness in decision making and management', *Journal of Community Psychology*, vol. 36, no. 3, pp. 387-398.

Janssen, O 2004, 'How fairness perceptions make innovative behaviour more or less stressful', *Journal of Organizational Behavior*, vol. 25, no. 2, pp. 201-215.

Karasek, RA 1979. 'Job demands, job decision latitude, and mental strain: Implications for job redesign'. *Administrative Science Quarterly,* vol. 24, no. 2, 285-308.

Karasek, R 1985. *Job Content Questionnaire and user's guide.* Los Angeles: Department of Industrial and Systems engineering.

Karasek, R & Theorell, T 1990, Healthy work: Stress, productivity, and the reconstruction of working life. New York: Basic Books, pp. 89-103.

Kessler, RC & Mroczek, D 1994, *Final Versions of Our Non-Specific Psychological Distress Scale*. Ann Arbor, MI: An Institute for Social Research.

Kivimaki, M, Elovainio, M, Vahtera, J, Virtanen, M & Stansfeld, SA 2003, 'Association between organizational inequity and incidence of psychiatric disorders in female employees', *Psychological Medicine,* vol. 33, no. 2, pp. 319-326.

Kivimaki, M, Vahtera, J, Pentti, J & Ferrie, JE 2000, 'Factors underlying the effect of organisational downsizing on health of employees: longitudinal cohort study', *British Medical Journal*, vol. 320, pp. 971-975.

McFarlin, DB & Sweeney, PD 1992, 'Distributive and procedural justice as predictors of

satisfaction with personal and organizational outcomes', *The Academy of Management Journal*, vol. 35, no. 3, pp. 626-637.

McVicar, A 2003, 'Workplace stress in nursing: A literature review'. *Journal of Advanced Nursing*, vol. 44, no. 6, pp. 633-642.

Munro, L, Rodwell, J & Harding, L 1998, 'Assessing occupational stress in psychiatric nurses using the full job strain model: The value of social support to nurses'. *Journal of Nursing Studies*, vol. 35, no. 6, pp. 339-345.

Pekkarinen, L, Sinervo, T, Elovainio, M, Noro, A & Finne-soveri, H 2008, 'Drug use and pressure ulcers in long-term care units: Do nurse time pressure and unfair management increase the prevalence?', *Journal of Clinical Nursing*, vol. 17, no. 22, pp. 3067-3073.

Quinne, L 1999, 'Workplace bullying in an NHS community trust'. *British Medical Journal*, vol 318, 228-232.

Van Der Doef, M & Maes, S 1999, 'The job demand-control(-support) model and psychological wellbeing: A review of 20 years of empirical research', *Work & Stress*, vol. 13, no. 2, pp. 87-114.

Van Yperen, NW & Hagedoorn, M 2003, 'Do high job demands increase intrinsic motivation or fatigue or both? The role of job control and job social support', *Academy of Management Journal*, vol. 46, no. 3, pp. 339-348.

Table 1. Means, standard deviations, reliability coefficients and correlations between all variables.

	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Job demands	42.84	5.81	.85										
2. Job control	34.05	3.40	.22**	.64									
3. Supervisor support	11.48	3.32	.04	.09	.89								
4. Co-worker support	12.69	2.12	.00	.13	.30**	.77							
5. Outside work support	13.41	2.67	-.25**	.05	.23**	.25**	.85						
6. Procedural justice	19.53	5.92	-.17*	-.18*	.30**	.08	.24**	.90					
7. Distributive justice	10.44	4.46	-.42**	.02	.14	.03	.15*	.46**	.93				
8. Interpersonal justice	15.34	3.56	-.09	.20**	.39**	.06	.12	.41**	.30**	.93			
9. Informational justice	17.48	4.41	-.09	.23**	.37**	.11	.11	.48**	.36**	.77**	.94		
10. Job satisfaction	22.54	4.51	.16*	.22**	.28**	.17*	.08	.21**	.24**	.15*	.20**	.84	
11. Psychological Distress	15.21	5.19	.03	-.01	-.15*	-.06	-.18*	-.11	-.05	-.15*	-.15*	-.09	.87
12. Depression	4.89	4.66	.21**	.00	-.16*	-.06	-.26**	-.17*	-.24**	-.13	-.17*	-.24**	.64**

Note. The alpha coefficients for each variable are displayed on the diagonal, except for depression, which had a coefficient of .87.
*p<.05
**p<.01

Table 2. Results of multiple regression analysis for each outcome variable.

	Job Satisfaction			Psychological Distress			Depression		
	B	SE B	β	B	SE B	β	B	SE B	β
(1) Demands	-.20	.07	-.25**	.18	.07	.24**	.05	.02	.22*
(1) Control	.26	.11	.20*	-.03	.12	-.02	-.02	.03	-.05
(1) Supervisor Support	.33	.12	.24**	.02	.12	.02	-.04	.03	-.10
(1) Coworker Support	.10	.17	.05	-.08	.17	-.04	.04	.05	.07
(1) Outside work support	-.20	.17	-.12	-.36	.18	-.22*	-.34	.16	-.19*
(2) Demands^2	-.01	.01	-.05	-.01	.01	-.05	.00	.00	-.04
(2) Control^2	.00	.02	-.01	-.01	.02	-.06	.00	.01	.04
(2) Supervisor support^2	.02	.03	.06	.06	.03	.17†	.00	.01	.01
(2) Coworker support^2	.05	.06	.07	-.03	.06	-.03	-.01	.02	-.02
(2) Outside work support^2	-.05	.04	-.14	-.07	.05	-.17	.01	.01	.04
(3) Demands x job control	.02	.02	.09	.01	.02	.04	.01	.01	.12
(3) Demands x supervisor support	.00	.02	.01	-.05	.02	-.22*	-.01	.01	-.21*
(3) Demands x co-worker support	.00	.03	.00	.00	.03	-.01	.00	.01	.02
(3) Demands x outside work support	-.02	.03	-.07	.00	.03	.01	.00	.01	.02
(3) Control x supervisor support	.04	.03	.11	-.01	.03	-.03	.01	.01	.08
(3) Control x coworker support	.03	.05	.04	-.01	.05	-.02	-.01	.01	-.09
(3) Control x outside work support	-.03	.05	-.06	-.02	.05	-.03	.01	.01	.06
(4) Demands x control x supervisor support	.01	.01	.08	.00	.01	-.02	.00	.00	-.12
(4) Demands x control x co-worker support	.01	.01	.08	.00	.01	-.05	.00	.00	.08
(4) Demands x control x outside work support	.01	.01	.11	.00	.01	.01	.00	.00	-.13
(5) Procedural justice	.00	.07	.00	-.05	.07	-.07	-.01	.02	-.03
(5) Distributive justice	.05	.09	.05	-.01	.09	-.01	-.02	.02	-.06
(5) Interpersonal justice	-.08	.14	-.07	.06	.15	.05	.04	.04	.12
(5) Informational justice	.02	.12	.02	-.18	.12	-.18	-.07	.03	-.24*
(6) Procedural justice^2	-.01	.01	-.08	.00	.01	.01	.00	.00	.09
(6) Distributive justice^2	.01	.02	.02	-.03	.02	-.13	-.01	.01	-.24**
(6) Interpersonal justice^2	-.02	.03	-.11	.02	.03	.06	-.01	.01	-.14
(6) Informational justice^2	.00	.02	-.01	.01	.02	.04	.00	.01	.06
(7) Procedural justice x distributive justice	.04	.02	.28**	.00	.02	.03	.00	.00	.11